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SPCIFICATION

1.[TITLE OF INVENTION]

A stem for a tubular bulb

2.[WHAT IS CLAIMED IS]

(1) A stem for a tubular bulb comprising a flared tube, and an exhaust pipe which is connected to the flared tube and whose exhaust hole is opened at an exhaust pipe connected portion of the flared tube, characterized in that the exhaust hole of the exhaust pipe is opened on an axial line of the flared tube.

(2) A stem for a tubular bulb according to claim 1, wherein a recessed groove communicating with the exhaust hole of the exhaust pipe is provided at a pressure collapsed portion which is positioned at an upper portion of the flared tube and which supports a lead wire in a pressure-collapsed manner.

3. DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a stem for a tubular bulb and in particular to improvement in structure of a stem for such a tubular bulb as a fluorescent lamp.

A stem for a tubular bulb such as a fluorescent lamp is

manufactured by inserting a lead wire and an end portion of an exhaust pipe into a flared tube having a flare formed by heating and expanding one end of a stem tube such as lead glass or the like, heating and pressure-collapsing the other end of the flared tube to introduce air into the exhaust pipe, sealing the lead wire in the glass constituting the flared tube, and connecting the end of the exhaust pipe to the flared tube to provide an exhaust hole at the end of the exhaust pipe connected to the flared pipe. According to such a method for manufacturing a stem for a tubular bulb, it becomes easy to open the exhaust hole of the exhaust pipe at a side wall nearer to the flare side than the pressure-collapsed portion of the flared tube. There occurs a drawback that, when the exhaust hole is opened at this portion, such gas as air, inert gas or the like is jetted towards fluorescent material coating on the glass bulb, for example, in a step of reducing strain of glass by introducing air to softened glass bulb to expand the glass bulb when a stem is fixed to an end portion of the glass bulb coated with fluorescent material in a sealing manner, or a step of introducing gaseous nitrogen, inert gas or the like at an exhaust step, so that the fluorescent material coated on the glass bulb is peeled off by the gas. There is a problem that the drawback may be amplified in a fluorescent material coating manufacturing method of a type where pressing-in of fluorescent material particles into an inner surface of the glass bulb is reduced in order to improve the strength of the glass bulb.

As a stem for a tubular bulb for reducing the above defects,

there are stems for a tubular bulb having structures shown in Figs. 1(a) and 1(b), and Figs. 2(a) and 2(b). That is, Fig. 1(a) is a plan view of a stem for a tubular bulb of a system (A) manufactured in a conventional manner and Fig. 1(b) is a sectional view of the stem for a tubular bulb taken along the line A-A in Fig. 1(a). In these figures, a flare (2) and a pressure-collapsed portion (3) opposed thereto are formed in a flared tube (1), an end portion of an exhaust pipe (4) connected to the flared tube (1) is connected to an exhaust pipe connecting portion (5) of the flared tube (1) to be opened so as to form an exhaust hole (6). In this structure, the exhaust hole (6) does not exist on an axial line of the flared tube (1) where a lead wire (7) exists and an edge portion (8) is provided on a top portion of the pressure-collapsed portion (3). A tungsten coil filament (10) is connected to a distal end of the lead wire (7) of a stem (9). In the stem (9) structured as shown in Figs. 1(a) and 1(b), since the exhaust hole (6) does not exist on the axial line of the flared tube (1) and is shifted therefrom, the strength of the pressure-collapsed portion (3) can be maintain sufficiently high, but gas jetted from the exhaust hole (6) can not be prevented from being directed towards a glass bulb coated on its inner face with fluorescent material completely. Also, since the edge portion (8) is provided, such a structure is employed that emissive material (not shown) coated on the tungsten coil filament (10) is neither injured nor peeled off by collision of gas flow to the emissive material. In recent years, however, since peeling-off of the emissive material does

not occur by such a degree of collision of the gas flow because of improvement in emissive material, the edge portion (8) merely serves as a guide for guiding gas flow towards the glass bulb. Therefore, there is a drawback that peeling-off of fluorescent material can not be prevented and it is difficult to reduce the amount of the peeling-off. Also, Fig. 2(a) and Fig. 2(b) are respectively a plan view of a stem for a tubular bulb of a conventional system (B), in which the edge portion (8) shown in Fig. 1(a) and 1(b) is removed, and a sectional view of the stem for a tubular bulb taken along the line B-B in Fig. 2(a), where the same parts or member as those in Figs. 1 are denoted by the same reference numerals. Even in a stem (11) of this system (13), the gas jetted from the exhaust hole (6) can not be prevented from being directed towards the glass bulb coated on its inner face with fluorescent material. Therefore, there is a drawback that such an effect that the amount of peeling-off of the fluorescent material can be reduced becomes small.

The present invention has been made in view of the above, and an object thereof is to provide a stem for such a tubular bulb as a fluorescent bulb having an improved structure where fluorescent material coated on an inner wall of a glass bulb is prevented from being peeled off by gas jetted form the exhaust hole of the exhaust pipe.

An embodiment of the present invention will be explained in detail below with reference with Figs. 3(a) and 3(b). Fig. 3(a) is a plan view of a stem for a fluorescent bulb of an embodiment of the present invention, and Fig. 3(b) is a sectional

view of the stem for a fluorescent bulb taken along the line C-C shown in Fig. 3(a). An exhaust pipe (23) is connected to a flared tube (22) of a stem (21), an exhaust hole (25) is opened at an exhaust pipe connecting portion (24) of the flared tube (22). The above exhaust hole (25) communicates with a recessed groove (29) of a pressure-collapsed portion (28) which supports a lead wire (27) of the stem (21) formed on the side opposed to a flare (26) of the flared tube (22) in a pressure-collapsing manner, and the exhaust hole (25) is opened on an axial line (30) of the flared tube (22). Reference numeral (31) denotes a tungsten coil filament connected to a distal end of the lead wire (27). As shown in Fig. 3(a), the pressure-collapsed portion (28) has the recessed groove (29) on the side of the exhaust hole (25), and the end portion of the recessed groove (29) holds the lead wire (27) on the diameter (reference numeral (32) in Fig. 3(a)) of the flared tube (22) including the axis (30) of the flared tube (22).

Since the present invention has the structure that the exhaust hole of the exhaust pipe is opened on the axis of the flared tube, such gas as air, nitrogen gas, inert gas or the like jetted in a manufacturing process for a fluorescent lamp or the like is prevented from directly striking on a fluorescent material coating or film coated on an inner wall of the glass bulb. Therefore, such an effect can be achieved that the fluorescent material coating is prevented from being peeled off. When the pressure-collapsed portion of the stem is formed in a curved shape including the recessed groove, as the embodiment,

the strength of the pressure-collapsed portion can be secured sufficiently. Accordingly, even when the present invention is applied to, for example, a method for manufacturing a fluorescent lamp where pressing-in of fluorescent material particles into the inner surface of the glass bulb is reduced, such a significant effect can be achieved that peeling-off accident of the fluorescent material is reduced. Incidentally, a bottom portion (33) of the recessed groove (29) shown in Fig. 3(b) can be expanded from the axis (30) of the flared tube (22) in a direction opposed to the exhaust hole (25) by the distance of 1/2 of an inner diameter of the exhaust pipe (23). The strength of the pressure-collapsed portion may be reduced when the expansion exceeds the distance.

As described in detail above, since the present invention is a stem for a tubular bulb comprising a flared tube, and an exhaust pipe which is connected to the flared tube and whose exhaust hole is opened at an exhaust pipe connected portion of the flared tube, characterized in that the exhaust hole of the exhaust pipe is opened on an axial line of the flared tube, the present invention has an effect that, even when such gas as air, inert gas or the like is jetted in the glass bulb of the fluorescent lamp from the exhaust pipe, for example, in a manufacture of a fluorescent lamp, the collision of the gas on to the fluorescent material coated on an inner wall of the glass bulb is reduced, peeling-off of the fluorescent material coating from the inner wall of the glass bulb is significantly reduced, for example, peeling-off of the fluorescent material

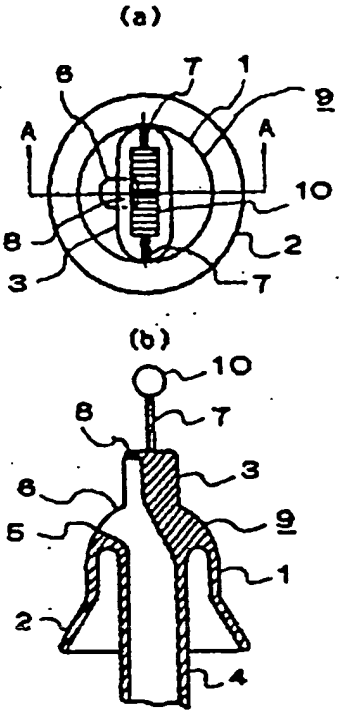
coating is considerably reduced even in the method for manufacturing a fluorescent lamp of a type where pressing-in of fluorescent material particles into an inner surface of the glass bulb is reduced so that a stem for a tubular bulb where pressing-in of fluorescent material particles into an inner surface of a glass bulb is decreased and which allows manufacture of a fluorescent lamp where fluorescent material coating is not peeled off.

4.BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1(a) is a plan view of a stem for a tubular bulb of a system (A) manufactured in a conventional manner; Fig. 1(b) is a sectional view of the stem for a tubular bulb of the system (A) taken along the line A-A shown in Fig. 1(a); Fig. 2(a) is a plan view of a stem for a tubular bulb of a conventional system (B) where an edge portion shown in Figs. 1 is removed; Fig. 2(b) is a sectional view of the stem for a tubular bulb of the above system (B) taken along the line B-B shown in Fig. 2(a); Fig. 3(a) is a plan view of a stem for a fluorescent lamp of an embodiment of the present invention; and Fig. 3(b) is a sectional view of the stem for a fluorescent lamp taken along the line C-C shown in Fig. 3(a).

21... stem; 22... flared tube; 23... exhaust pipe; 24... exhaust pipe connecting portion; 25... exhaust hole; 27... lead wire; 28... pressure-collapsed portion; 29... recessed groove; and 30... axis of flared tube.

第 1 図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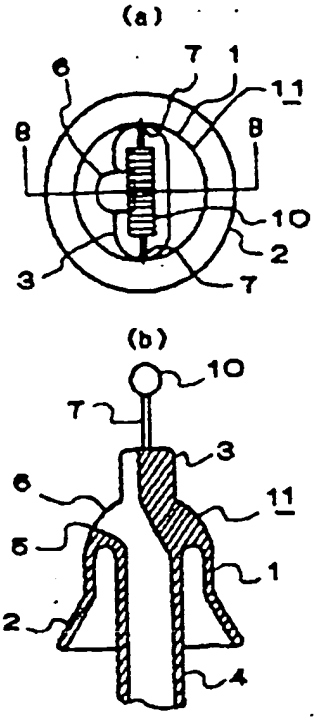
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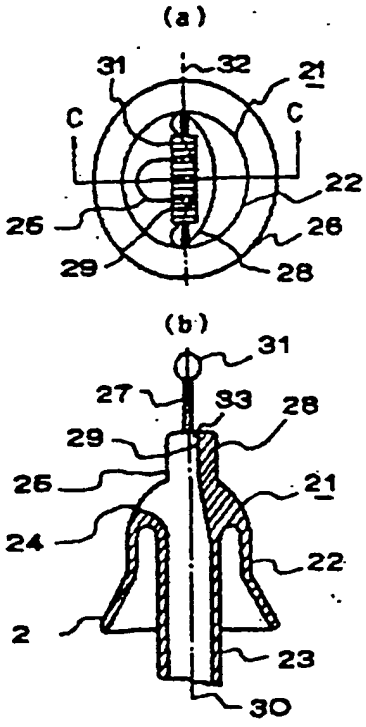
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